BROOKHAVEN NATIONAL LABORATORY

Work Permit # DRL-2014-006
Work Order # ___
Job# ___ Activity# ___

See "Instructions for Filling out the Work Permit" contained in the Work Planning and Control for Experiments and Operations Subject Area.

1. Work request WCC fills out this section. ☐ **Standing Work Permit**

Requester: Don Lynch	Date: 5/27/2014	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch		Start Date: 5/28/2014	Est. End Date: 7/7/2014
Brief Description of Work: Radiation Monitoring Test, CM region			
Building: 1008	Room: IR, CM region	Equipment: He3 proportional Chamber	Service Provider PHENIX Techs

2. WCC, Requester/Designee, Service Provider, and ESS&H (as necessary) fill out this section or attach analysis

ESS&H ANALYSIS

Radiation Concerns	☒ None	☐ Activation	☐ Airborne	☐ Contamination	☐ Radiation	☐ NORM	☐ Other
☐ Special nuclear materials involved, notify Isotope Special Materials Group				☐ Fissionable/Radiological materials involved, notify Laboratory Nuclear Safety Officer			
Radiation Generating Devices:	☐ Radiography		☐ Moisture Density Gauges		☐ Soil Density Gauges		☐ X-ray Equipment

Safety and Security Concerns	☐ None	☐ Explosives	☐ Transport of Haz/Rad Material	☐ Pressurized Systems
☐ Adding/Removing Walls or Roofs	☐ Critical Lift	☐ Fumes/Mist/Dust*	☐ Magnetic Fields*	☐ Railroad Work
☐ Asbestos*	☐ Cryogenic	☐ Heat/Cold Stress	☐ Nanomaterials/particles*	☐ Rigging
☐ Beryllium*	☐ Electrical	☐ Hydraulic	☐ Noise*	☐ Silica*
☐ Biohazard*	☐ Elevated Work	☐ Lasers*	☐ Non-ionizing Radiation*	☐ Security Concerns
☐ Chemicals/Corrosives*	☐ Excavation	☐ Lead*	☐ Oxygen Deficiency*	☐ Suspect/Counterfeit Items
☐ Confined Space*	☐ Ergonomics*	☐ Material Handling	☐ Penetrating Fire Walls	☐ Vacuum
* Safety Health Rep. Review Required	☐ Haz, Rad, Bio Material Exceed DOE 151.1-C Levels - Contact OEM			☒ Other Securing device in magnetic field

Environmental Concerns	☒ None	☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad)	☐ Land Use Institutional Controls	☐ Soil Activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use	☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)	☐ Oil/PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption	☐ Spill potential	☐ Waste-Industrial	☐ Underground Duct/Piping
Waste disposition by:			☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity:	☒ No ☐ Yes		

FACILITY CONCERNS	☒ None	☐ Intermittent Energy Release		
☐ Access/Egress Limitations	☐ Electrical Noise	☐ Potential to Cause a False Alarm		☐ Vibrations
	☐ Impacts Facility Use Agreement		☐ Temperature Change	☐ Other
☐ Configuration Management	☐ Maintenance Work on Ventilation Systems		☐ Utility Interruptions	

WORK CONTROLS

Work Practices

☐ None	☐ Exhaust Ventilation	☒ Lockout/Tagout	☐ Spill Containment	☐ Security (see Instruction Sheet)
☐ Back-up Person/Watch	☐ HP Coverage	☐ Posting/Warning Signs	☐ Time Limitation	☐ Other
☐ Barricades	☐ IH Survey	☐ Scaffolding-requires inspection	☐ Warning Alarm (i.e. "high level")	☐ Electrical Inspection Required

Personal Protective Equipment

☐ None	☐ Ear Plugs	☒ Gloves as appropriate	☐ Lab Coat	☒ Safety Glasses as appropriate
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator*	☐ Safety Harness

☐ Disposable Clothing	☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☒ Safety Shoes	☐ High visibility cloths/vest	☐ Other

Permits Required (Permits must be valid when job is scheduled.)

☒ None	☐ Cutting/Welding	☐ Impair Fire Protection Systems
☐ Concrete/Masonry Penetration	☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No
☐ Confined Space Entry	☐ Electrical Working Hot	☐ Other

Dosimetry/Monitoring

☒ None	☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD
☐ Air Effluent	☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization
☐ Ground Water	☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☐ Other
☐ Liquid Effluent	☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump	

Training Requirements (List specific training requirements)

PHENIX Awareness, CA Access or Equiv.

Based on analysis above, the Review Team determines the risk, complexity, and coordination ratings below:				**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ESS&H Risk Level:	☒ Low	☐ Moderate	☐ High	WCC:	Date:
Complexity Level:	☒ Low	☐ Moderate	☐ High	Service Provider:	Date:
Work Coordination:	☒ Low	☐ Moderate	☐ High	Authorization to start	Date:
				(Department/Division, or their equivalent, Sup/WCC/Designee)	

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, scheduling, coordination, notifications, and personnel availability need to be addressed in adequate detail): sewe attached plan
Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring) None
Notifications to operations and Operational Limits Requirements: None
Post Work Testing, Notification or Documentation Required:

Job Safety Analysis Required: ☐ Yes ☒ No	Review Done: ☒ in series ☐ team

Reviewed by: * Primary Reviewer signature means that the Review Team members were appropriate for the work that was planned, the Team visited the job site, hazards and risks that could impact ESS&H have been considered and controls established according to BNL requirements. In addition, this signature indicates that applicable JRAs, FRAs, as well as other planning documents have been reviewed and training requirements have been identified and recorded on this permit.

Title	Name (print)	Signature	Life #	Date
ES&H Professional				
F&O Facility Project Manager				
Service Provider				
Work Control Coordinator	Don Lynch		20146	
Safety Health Representative				
Research Space Manager				
Other				
Other (PHENIX Escort)				
Required Walkdown Completed				
*Primary Reviewer				

4. Job site personnel (Supervisor and workers) fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments) and all training required for this permit is current/complete. Job Supervisor/Contractor Supervisor signatures also includes verification that worker training required for this permit is current/complete.

Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:

Workers are encouraged to provide feedback on ESS&H concerns or on ideas for improved job work flow. Use feedback form or space below.

5. Department/Division, or their equivalent, Line Manager or Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)

Name:	Signature:	Life#:	Date:

6. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)

a) WCM/WCC: Are there any changes as a result of worker feedback? ☐ Yes ☐ No

Note: See Work Planning and Control for Experiments and Operations Subject Area section 2.6.

7. Post Job Review/Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of job site to work supervisor.) The WCC ensures that the change process to update drawings, placards, postings, procedures, etc., is initiated, if necessary.

Name:	Signature:	Life#:	Date:
Comments:			

Work plan Attachment **WP# DRL-2014-006**

Run 14 Radiation Monitoring Test

INTRODUCTION

On the next access/maintenance day, PHENIX Techs will install some additional radiation monitoring in the central region, using one more of the CERN "radmon" boards which are already installed on the PHENIX magnet poletips and in the MPC cavity, as well as a single box containing a Hammamatsu 10362 silicon photomultiplier (SiPM) which will be used to put a limit of radiation damage during the final two weeks of the 200 GeV Au+Au run.
place an additional radmon board in the IR in the central region, along with a little box with an SiPM to measure the leakage current over the last two weeks of the run 14 Au+Au run.

PHENIX Techs will also install in the central region a neutron detector, which consists of the same He3 filled proportional tubes used by STAR to assess the thermal neutron background (Nuclear Instruments and Methods in Physics Research A 756 (2014) 68–72). This device is a stainless steel tube connected by a single RG59 cable to a small NIM bin of electronics outside the magnet. The device will be mounted on the PHENIX CM lift table.

The chamber is 304 stainless, which is non-magnetic, but which will be securely attached to the lift table which is magnetic in any event. The readout would just be into existing RHIC scalers with existing RHIC cables.

Procedures

All work described herein shall be coordinated and performed by PHENIX technicians, engineers and/or PHENIX experts as appropriate to the. All working personnel shall have appropriate skills and training to accomplish the work described herein. All workers shall have and wear the appropriate personal protective equipment (PPE) for each task.

1. After the maintenance access is commenced, PHENIX NOrth South and Central Magnets shall be turned off and locked out..

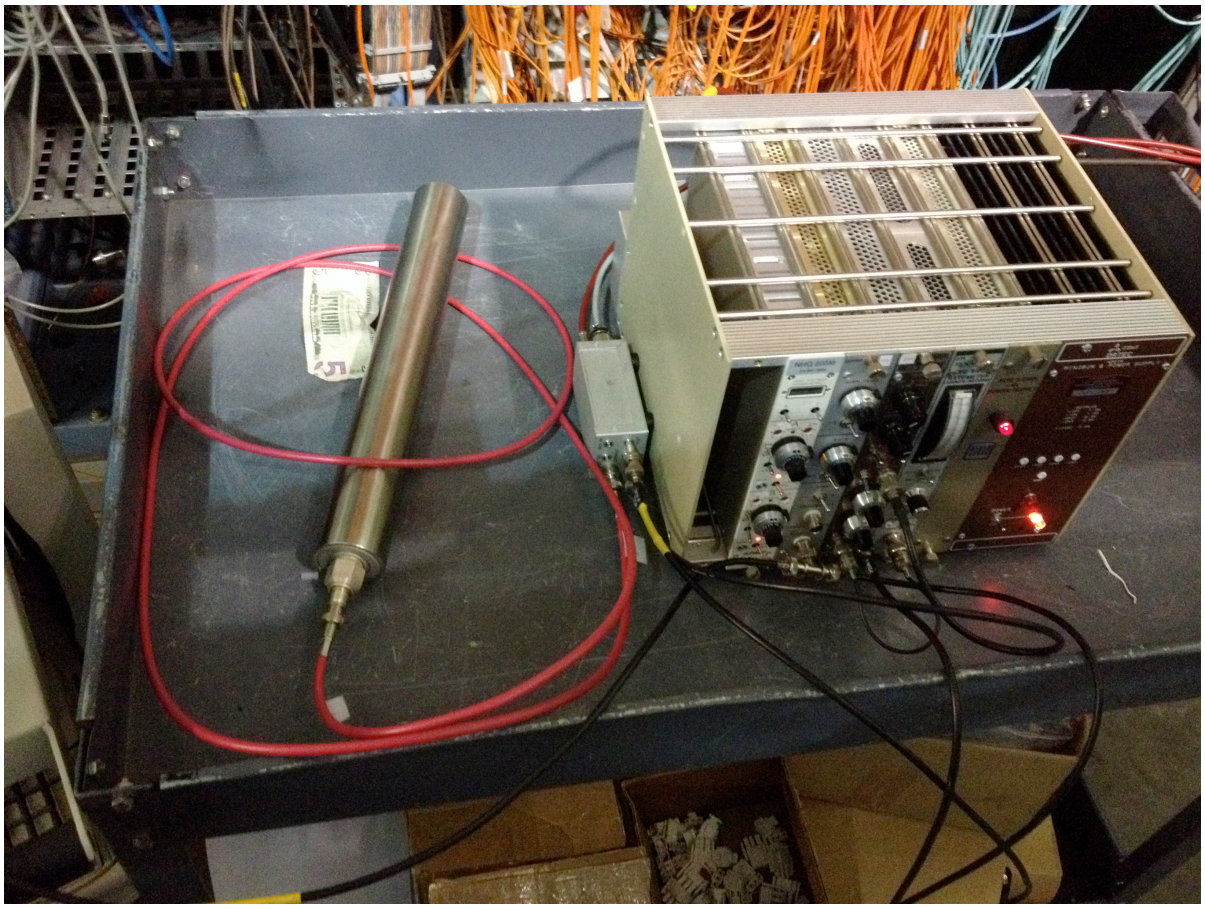
2. Access to the CM area shall be achieved by moving the EC to the east.

3. The monitoring package shall be securely attached to the PHENIX CM lift table in a manner determined appropriate by PHENIX techs and at a location selected by PHENIX experts.

4. All cables are to be run neatly, safely and efficiently from the equipment to a suitable location on the northwest end of the PHENIX Central Magnet, where they will be connected to existing data acquisition equipment as directed by PHENIX experts and operational tests shall be performed to demonstrate adequacy of the installation as directred by PHENIX experts.

5. After installation and testing. the EC shall be returned to its run position and all PHENIX magnets unlocked and ramped back to appropriate operating fields.

The components, ready for installation in the IR, are shown in the folllowing picture.



All of the tasks described above are common worker planned work tasks. Upon completion of the installation all workers shall sign this work permit and any “lessons learned” or other appropriate comments and observations concerning this work shall be noted on the work permit or other sheets which shall then be attached to the work permit. This work permit shall then be closed out.